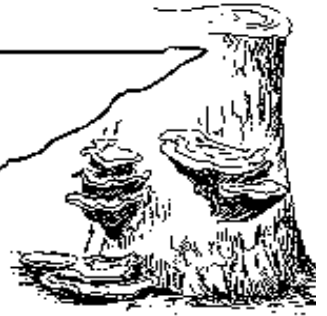




# Tennessee Forest Health Monitor

Department of Agriculture, Forestry Division



## April 2001

Hello and welcome to the first edition of Tennessee's Forest Health Highlights for 2001 as the dogwoods begin to bloom.

An early October **frost** followed by warm weather through November caused leaves to remain on some hardwoods through the end of December. **Rainfall** amounts this winter moderately improved the drought conditions statewide. Conditions in West and East Tennessee still remain abnormally dry.

Cold winter temperatures in December and early January did not significantly affect the **southern pine beetle (SPB)** populations statewide, following evaluations of trees on the Cumberland Plateau. However, the average winter temperatures did keep the SPB in the same multiple tree spots they attacked last fall. Those trees are currently turning color now with larger spots in southeastern Tennessee doubling in size since last fall. It appears that most SPB populations will continue at high levels through mid-summer. If summer drought becomes a factor, populations may grow this fall as well.

Plant inspectors with TDA, Regulatory Services Division and USDA APHIS

PPQ have been working with the Vehicle Inspection officers to monitor truck nursery shipments into the State for **imported fire ants**. Truck weigh stations in Coffee and Knox Counties have been the focus of this activity. At least one truck from the states along the southern border of Tennessee has been prevented from delivery of its nursery stock to its Tennessee destination. Federal money for hiring seasonal plant inspectors will be in place this fall for IFA detection in nursery outlets and newly-landscaped locations.

As **pollen** increases statewide, several folks have asked which trees cause the greatest problem. Dr. Phil Jones with the Vanderbilt Adult Allergy Clinic indicated that trees with showy flowers such as Bradford pear, ornamental plums and cherries, yellow poplar and magnolias are insect-pollinated and not wind-pollinated. The trees with more inconspicuous blooms are wind-pollinated and create a more allergic response.

Redcedar and elm are usually the first problem trees in the spring (February – April) for increased **pollen** production. From March to May, maple,

cottonwood, birch, and mulberry are big pollen producers as are boxelder, beech, sycamore and hackberry from April to May. Pine pollen because of its weight is quickly filtered out of most nasal passages. There are not common allergies with ash pollen as well. Oaks, walnut, and hickories are pollen producers from April to June, but willow has the longest pollen flight from February to July in Middle Tennessee.

**Southern pine beetle** populations were the highest (see enclosed map and table) since 1975 with more counties infested during one year (66) than any time of recorded beetle history. Over 9,000 spots and more than a \$16 million loss to landowners occurred. Several counties in the northern half of East Tennessee and the Cumberland Plateau have lost over 75 percent of its southern yellow pine (loblolly/shortleaf) component.

The **hemlock woolly adelgid** (HWA) has moved about 100 miles west from its known location in the North Carolina foothills to Graham, Macon and Yancey Counties. Unfortunately some of these locations border the Great Smoky Mountains National Park and Joyce Kilmer National Park on the North Carolina side as well as being near the national forest. Movement of this exotic pest by weeping Asian hemlock varieties have compounded the problem in western North Carolina. These varieties harbor HWA but are not killed.

Currently there are 25 counties in East Tennessee and the Cumberland Plateau with significant hemlock populations. The Connecticut Agricultural Experiment Station is in its second year of release and study of the introduced beetle predator, Pseudoscymnus tsugae

throughout the range of **HWA**. The rapid increase of HWA populations in the 1990's spurred a previously somewhat innocuous insect to be a tree killer in 5 to 7 years in some areas of Virginia. Mild winters and summer droughts in hemlock stands are believed to be responsible for this increase. HWA will have an aesthetic impact on landscapes, parks and forests and will speed up the rate of change in the dynamic hemlock ecosystem. It will not eliminate these stands.

How does **HWA** spread? It is wind blown and carried by birds (some that are Neotropical migrants) that rest in hemlock. It is not a cold-tolerant insect and does not survive the cold, drying winds of winter. In addition, HWA does not tolerate rapid temperature extremes in the fall and spring.

Pine stands in the western half of the state (except southwestern Middle Tennessee) continued to have **Ips bark beetles** for the second year in a row following the summer drought. These infestations have declined this spring after the more abundant winter rainfall.

Three known infested counties have **gypsy moth** (GM) ground eradication projects in progress (Cumberland, Scott, and Sevier Counties). Two counties have increased moth catches (Campbell and Monroe Counties) triggering heavier trapping densities in 2001. All these locations were in East Tennessee and the Cumberland Plateau. There were increased catches of hitch-hiking moths in northeastern Tennessee – a result of the southern transport of higher north populations. (See enclosed map).

Most eastern white pine stands 20 years or younger have not been attacked by **SPB** in the northern Cumberland Plateau and east Tennessee.

**GM** catches in eastern Kentucky were reduced in 2000 (213 moths) in comparison to 1999 (507). However, defoliation increased dramatically in the neighboring state of West Virginia as well as Pennsylvania. Some evidence of infection by the **GM** fungus, Entomophaga was found in later stage larvae. A rainy spring timed with **GM** egg hatch and the young larvae crawling over the fungus spores on the soil surface allows the spores to germinate and infect the **GM** larvae.

Studies show that a reduction of about 20 percent in visitor days in recreation areas that have been defoliated by **GM** or where **GM** caterpillar are present.

Which trees beside black walnut put out **toxins** which inhibit or reduce other plant species' growth? Black cherry inhibits red maple, but it and sugar maple are affected by goldenrod and aster. Sassafras stops elm and maple from becoming established near it, and oak reduces sweetgum seed germination. Fescue also produces chemicals which affect sweetgum.

Did you know that the glassy-winged sharpshooter (a leaf hopper) is responsible for vectoring the bacterium *Xylella* which causes the **sycamore decline**? Crape myrtle is also a favorite host for this sharpshooter. The USDA Forest Service research group in Athens, Georgia is working with Westvaco to screen for resistance to this disease.

The dogwood research group for the University of Tennessee Department of Entomology and Plant Pathology in Knoxville have recently developed 3 dogwood horticultural varieties that are resistant to **powdery mildew**. Dr. Mark Windham has further information on these trees.

Since the loss of the chestnut, oaks and hickories have largely replaced this species in mast production. Prior to the **blight**, chestnut was the only consistent mast producer, and 5 of 10 years in the current post-chestnut era have mast levels below what is considered adequate for forest wildlife according to the Virginia Polytechnic Institute and State University researchers. Efforts to promote chestnut stump sprouts in timber harvesting deserve the support of foresters.

One disease which reduces mast yield and quality is **oak decline**. In the George Washington National Forest, Virginia, chestnut oak had the lowest mortality rate of all oak species and hickory in 1985. Even trees with severe decline have only a 25 to 35% reduction in mast production in comparison to black and scarlet oaks which decline more rapidly or die more suddenly.

Despite **drought** that was less intense than the previous two summers, the cumulative effect of reduced water tables caused continued oak/hickory mortality in scattered counties statewide. Often suppressed or older oaks died first (1 to 5 trees per acre) on southern and western facing slopes or sites with shallow soil depths. Some yellow poplar decline and mortality was observed in Middle and West Tennessee sometimes associated with **Fusarium** canker.

I bet you did not know the first **exotic biological control** released by the USDA was in 1883. Cotesia glomeratus (a wasp) was imported to control the cabbageworm. While this introduction was unsuccessful, control of the cottony cushion scale was achieved with the vedalia beetle in 1887.

Parasites of the **SPB** do forage in the pine canopy which led Dr. Fred Stephen of the University of Arkansas to envision a new tactic for direct control of the beetle. Aerial application of the product Eliminate (registered trademark) may be possible to feed the parasites the additional sugars and proteins necessary to increase their laying more eggs and strengthen their brood.

Stan Johnson reports that he heard **spring peepers** and **blue birds** singing on the same day February 7, 2001. **Black gnats** and **ticks** also converged on Hickman county the same day in early April.

**SPB** begin attacks in stands that are too thick and/or too old that have reduced growth rate. These high hazard stands are present in every county and have been stressed by the droughts of the last 3 years. The best spacing for pine plantations is 10 X 10 feet in lieu of a thinning market. When the live crown ratio (the percent of tree trunk supporting green foliage in comparison to the total tree height) drops below 40 percent, the growth rate begins to decline, and the pine becomes more attractive to the beetle. A high hazard stand should not be thinned when **SPB** populations are high.

The **West Nile Virus** (WNV) in Connecticut was first found in 1999 near a river where an unusual number of crows had died. Since then, 4 species of mosquitoes were found to vector the virus. Other bird species infected include Cooper's and red-tailed hawks and sandhill crane. Virus-infected horses were also reported. New York, Massachusetts and New Jersey also reported WNV-infected birds and that WNV can survive the winter in the Northeast. Fortunately, no songbirds were found to be infected. Will it move southward with bird migration?

**White pine cone beetles** continue to be the most damaging insects in Tennessee seed orchards, killing 500 bushels of seed estimated at \$25,000. But the loss due to SPB amounted to over 10 acres of loblolly and shortleaf orchards in East Tennessee. Virginia and loblolly pine progeny tests were also damaged.

A number of loblolly pine plantings in the western half of Tennessee have been severely damaged by **deer** this winter. In some cases, crops left in the field have drawn deer into the plantings. Retaining hardwoods in nearby forested stands to improve mast potential, habitat diversity and aesthetic quality is a trade-off with providing deer with more browse. Hardwoods are more effective in shading out browse than are pine stands, although stand density plays a role as well. Thinning of hardwood stands provides more browse. Cutting understory Chinese privet stands to ground level in northwest Georgia allowed the privet to be heavily used the first winter after cutting. Privet is an aggressive weed species and should not be encouraged in areas where it is not already established. Herbicides or

prescribed fire could also be used to put more browse within reach of deer.

Nearly all white pine less than one inch dbh were killed by one **prescribed fire** used to return oak/southern yellow pine to ridgetops in Eastern Kentucky.

However heavy seed crops reestablished white pine on these sites on the Daniel Boone NF. Prescribed burns were recommended every 10 to 20 years to control white pine competition with fire-adapted species on ridgetops.

**December ice damage** to the Ouachita and Ozark National Forests in Oklahoma and Arkansas amounted to over 600 thousand acres. Fortunately this damage skirted our state. Almost every 20 years, an ice event does occur in timber stands in Tennessee.

Herbicides have been used to kill grasses inhibiting growth of hardwood and pine seedlings. If these sprays remove cover and food from a well-established **vole** population, tree damage and mortality will result, especially when drought continues to suppress grass and plant regrowth. Check your vole populations before you spray!

The cutting of SPB-infested pine stands for salvage can create another potential pest problem. Populations of **pales weevil** will increase in the stumps of salvaged pines. Remember to wait 6 months following logging or site preparation before replanting.

**SPB** attacks have moved into the urban forests of East and Middle Tennessee. Currently both Dursban and lindane are labeled for cutting and hand spraying of infested trees or spraying uninfested trees. The urban labeling for Dursban

will expire at the end of this year but will continue for forest use. There are not effective systemic insecticides for tree injection registered for control of SPB in the state. Other alternatives include cut and leave and cut, pile and burn.

## FIELD REPORTS

**Nantucket pine tip moths** increased in southwestern Tennessee (McNairy and Shelby Counties) in the Cumberland Plateau (Cumberland County) and southeastern Tennessee Valley (Polk and Rhea Counties) on 2 to 4 year old loblolly pine (S. Huskey, S. Malone, P. Moditz, R. Rhinehart, B. Taylor).

**Red-headed pine sawfly** caused more defoliation of Virginia pine Christmas trees in north central Tennessee (Wilson County) and on loblolly pines in West Tennessee (Carroll and McNairy Counties) (P. Moditz, T. Tynes, B. Wright).

**Hypoxylon canker** increased on a number of oak species in West, Middle and upper East Tennessee (C. Gearhiser, T. Hall, M. Huddleston, J. McGaughey, B. Taylor).

**Indian wax scale** abundantly covered the twigs of hemlock in addition to secreting honeydew in Hamilton County (R. Rhinehart).

**Drought** killed 3 white pines in Obion County and 4 white pines in Putnam County, and scattered white pines in Davidson and Montgomery Counties (M. Huddleston, R. Stutts, B. Webster, G. Zimmerman).

**Oak bark scaler** damaged the outer bark of white oak in Putnam County (G. Zimmerman)

**Pine and meadow voles** chewed 70 percent of 3500 cherrybark oak in Obion County and scattered loblolly pine in Cumberland County (D. Davidson, S. Malone).

**Clear-winged borers** damaged pin and red oaks in Davidson and Sumner Counties (D. Miller).

**Gouty oak galls** caused severe damage to southern red oak in Robertson County as well as red oaks in Wayne and Haywood Counties (B. Hall, D. Miller, B. Taylor).

**Red oak borer** infested a declining black oak in Roane County and a red oak in Davidson County (D. Miller and C. E. Smith).

**Twig girdlers** caused numerous twig damage (10 to 20%) to hickories in Union County as well as Carroll County (J. L. Elkins and T. Tynes).

**Green stink bugs** spotted over half the sweet pecan nuts on 10 trees in Carroll County (T. Tynes).

**Wood borers** infested 9 hardwoods in Putnam County following mechanical damage (G. Zimmerman).

**Southern pine beetle** reports have come in from most all foresters in the eastern half of the State as well as southwestern Middle and West Tennessee.

**Ips beetle** killed 60 scattered loblolly pines in Smith County, and single trees in Carroll, Davidson, Dyer, Fayette,

Gibson, Lauderdale and Weakley Counties (S. Brabec, J. Replogle, R. Stutts, B. Taylor, T. Tynes).

**Resinous cankers** were present on over-mature white pine in Campbell and Union Counties (J. Elkins).

**Red headed ash borer** killed portions of a redbud in Putnam County (G. Zimmerman).

**Bird peck** was reported on sugar maple in Campbell County (J. Walden).

**Deer** damaged 90 percent of 140 acres of newly planted loblolly pine in Hardeman County in a previously cultivated field and 98 percent of 6 acres of newly planted loblolly pine in Dickson County (D. Brown, P. Moditz).

**White pine adelgids** were common on white pine Christmas trees around Knoxville (M. Williams).

**Nutrient deficiency** of white pine was present in Overton County (J. Thompson).

**Oak decline** killed scattered trees in West, Middle, Cumberland Plateau and southeastern Tennessee Valley Counties (S. Brabec, C. Gearhiser, L. Grape, B. Hall, T. Hall, M. Huddleston, J. Lane, J. McCarty, J. Thompson, T. Tynes).

**Black turpentine beetles** attacked white pine in Rhea County (S. Hayes Gann).

**Winds** damaged large oaks and maples in Blount, Loudon and Monroe Counties (B. Thompson).

**Sugar maple decline** increased in eastern Middle Tennessee (T. Hall, J. Replogle, G. Zimmerman).

**Fusarium canker** infected yellow poplar in southeastern Middle Tennessee (T. Hall).

**Drought** caused decline of yellow poplar in Carroll and Weakley Counties (R. Stutts and T. Tynes).

**Nectria canker** continued to infect sassafras in stands with a high percentage of this species in Campbell and Union Counties (J. Elkins).

Questions or Contributions to:

Bruce Kauffman  
Forest Health Specialist  
TDA, Forestry Division  
P. O. Box 40627, Melrose Station  
Nashville, TN 37204

Phone: 615/837-5176  
FAX: 615/837-5003  
E-mail: bkauffman@mail.state.tn.us